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which each explorer gives, every year, the summary of the work done to the director of the survey, has not yet been issued, although the volume in which it ought to be inserted was printed three years ago. The stopping of the distribution of the "Eleventh Annual Report" is somewhat mysterious. Two other printed Annual Reports, the twelfth and thirteenth, remain also undistributed, waiting for the distribution of the eleventh.

Mr. A. Hyatt, in a printed letter in *The American Geologist* for April, 1893, p. 281, admits that his verbal opinion, quoted by me at page 213 of the same periodical, "is correct;" but that he had "at present absolutely no opinion about the age of rocks of this region." A rather curious conclusion for an explorer who has passed two months on the same ground where I was only two days, and who has studied the collection of fossils he made during a whole winter.

Evidently there is some secret about it. My old adversaries, almost all alive now, with the exceptions of the two Shumards, Meek and Newbery, are still at work against me. But I have resisted their combined attacks during forty years, and I can continue very well the defence of my observations and opinions.

However, I shall say nothing more for the present, waiting until after the publication, by some paleontologist, of the fossils collected at the Tucumcari by Messrs. Hill, Hyatt, and Cummins, with descriptions and good figures; for it is absolutely useless to discuss any longer, without proper documents in the hands of geologists, in order that everyone interested in the question may be able to judge for himself as to the conclusions arrived at by the different parties.

JULES MARCOU.

Cambridge, Mass.

Natural and Artificial Cements in Canada.

YOUR issue of March 31, 1893, contains an article on "Natural and Artificial Cements in Canada," which in part is incorrect, and I wish to set you right with regard to the class of raw material from which the "Star" Portland cement is manufactured.

In the first place, Star cement is manufactured from shell marl, which is thoroughly decomposed, and containing from 95 to 98 per cent pure carbonate of lime, the clay used is an alluvial blue clay.

The analyses of our clays and marl show them to be of superior quality and equal to any deposits of a similar nature; this has also been fully demonstrated in the practical results obtained by users of the cement when manufactured.

E. BRAVENDEE.

Napanee Mills, June 12.

Sound and Color.

On reading Professor Underwood's paper on the above subject in *Science* for June 16th, some rather peculiar experiences of my own, which I have never read or heard of in others, were freshly brought to mind.

When intently listening to certain, but by no means all, eminent speakers, and to a few operatic singers of great renown, I have for some years past distinctly detected, or rather have involuntarily become conscious of, an emanation of color from the head of the speaker or singer with each distinct tone of the voice. The more impassioned the words and tones the more intense the color, and the larger the visible aureole or color area. The color has thus far been limited, with a few exceptions, to a transparent and ethereal but decided blue. It emanates suddenly with each explosion of sound, passes upward like a thin cloud of smoke, and fades like a swiftly dissolving view. I noticed it for the first time while listening to Professor Felix Adler, later on when listening to Colonel Ingersoll, faintly over the head of William Winter; again quite distinctly in case of General Sherman and General Horace Porter, faintly in case of some other public speakers, including Anna Dickinson, Helen Potter, the elocutionist, and some eminent divines, but not at all in case of President Cleveland and some other equally prominent public men.

In case of singers, the most noted instances I can recall are the DeRetszke brothers, Jean and Edward, Mdme. Emma Eames, Lilli Lehmann, Mdme. Albani, Vogel, and Gudehus.

In case of Mdme. Lehmann the blue color verged towards a liquid green, and with Albani it was a pale sheen of silver vapor. In case of Vogel, the tenor, the aureole was an evanescent and

very pale straw color. In Mdme. Mielke the blue became a velvety purple or violet. Mdme. Nordica emitted an aureole of pale, translucent gold; Emma Juch gives me the impression of a delicate and liquid pink, while Patti seemed to emit no distinguishing color, but rather a kaleidoscopic blending of many colors.

I should be glad to hear from others who have noted similar phenomena, for I have been inclined to question the reliability of my own impressions, vivid as they have been, and many times repeated. Professor Underwood's recital inclines me to accord them a little more respect.

SAMUEL S. WALLIAN, M.D.

Washington Heights, City.

Age of Guano Deposits.

THE following particulars, recently given me by a friend who, years ago, was a sailor, and whom I know to be a man of the strictest veracity, may be of interest as possibly throwing some light on the age of guano deposits.

In the year 1840 his vessel loaded with guano on the island of Ichabo, on the east coast of Africa. During the excavations which were necessary, the crew exhumed the body of a Portuguese sailor, who, according to the head-board, on which his name and date of burial had been carved with a knife, had been interred fifty-two years previously. The top of this head-board projected two feet above the original surface, but had been covered by exactly seven feet of subsequent deposit of guano.

ROBERT RIDGWAY.

U. S. National Museum, Washington, D.C., June 23.

Correction.

IN 1887 I published in the *Canadian Record of Science* an account of a Permian glacial moraine in Prince Edward Island. I have recently examined this formation more carefully, and am not at all positive about its age. The bedding and jointage are conformable with the underlying formation, but the cementing material is purely calcareous, and the induration, though complete, may be recent. In the absence of organic evidence, I do not think we can positively say that this conglomerate is not Quaternary.

F. BAIN.

North River, P. E. Island.

BOOK-REVIEWS.

Geological Survey of Missouri. Vol. II. A Report on the Iron Ores of Missouri. By FRANK L. MASON. Jefferson City, December, 1892. Plates, Map, etc. 366 p.

Vol. III. A Report on the Mineral Waters of Missouri. By PAUL SCHWEITZER. Jefferson City, December, 1892. Plates, Map, etc. 256 p.

THERE are but few States in the Union that have not had at some time or other geological surveys of a part or the whole of their territory. As a general rule, the surveys have been conducted by different geologists, the same one seldom holding his position for a long period, and, in point of fact, the survey itself frequently ending before a decade has elapsed. There are, of course, notable exceptions to this, Minnesota, for example, where the State geologist has issued twenty annual reports, and New York, which has enjoyed an almost uninterrupted existence since 1836. Yet more remarkable in this latter case is the fact that the present head of the survey has been such for nearly fifty years and was one of the original corps in 1836. This veteran, as everyone knows, is Professor James Hall, still one of the most indefatigable of all American geologists.

The State of Missouri has had numerous surveys, which have been carried on under various heads. The first survey existed from 1853 to 1862, and published five reports; the second lasted from 1870 to 1874, and issued four reports; the third from 1876 to 1879, and published only one report; while the fourth has lasted from 1889 to date, and has published three bulky volumes, of which the present ones are two, five bulletins, an atlas of maps, and a biennial report. We thus see that under the present management more work has been done than in any of the other surveys lasting twice as long.